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In the Specification:

Please **add** a new heading at **page 1, above line 2**, as follows:

TITLE OF THE INVENTION

Please **add** a new heading at **page 1, above line 5**, as follows:

FIELD OF THE INVENTION

Please **add** a new heading at **page 1, above line 11**, as follows:

BACKGROUND INFORMATION

Please **add** a new heading at **page 1, above line 34**, as follows:

SUMMARY OF THE INVENTION

Please **replace** the paragraph at **page 2, lines 3 to 15**, with a replacement paragraph amended as follows:

This object is achieved by ~~the features of claim 1.~~ a method according to the present invention, for detecting the beginning of combustion in an internal combustion engine having several cylinders, from a rotation speed signal determined for a shaft of the internal combustion engine, in which

- at least one segment signal, whose signal length corresponds to an integral multiple of one or more full rotations of the shaft, is extracted from the rotation speed signal, so that each cylinder ignites

one time in the rotation angle range represented by the signal length,

- a cylinder signal, which substantially reproduces the operational state in one of the cylinders, is generated from the segment signal,
- the cylinder signal is transformed into a cylinder frequency signal in an angular frequency range,
- a signal information indicating the beginning of combustion in the associated cylinder is extracted from the cylinder frequency signal at at least one predefined angular frequency with regard to amplitude and phase values associated with the predefined angular frequency, and
- the beginning of combustion is detected from the signal information.

As a rule, the method according to the invention can do without any additional sensor technology. As a measurand it is based merely on the rotation speed signal, which, as a rule, is detected anyway and thus is already available in a control device of the internal combustion engine. Beyond this, the exact beginning of combustion can be easily detected on the basis of the cylinder signal transformed into the angle frequency range. For this purpose no extensive arithmetic operations occur. For transformation into the angle frequency range it can be reverted, if necessary, to signal transformation methods anyway existing in the control device.

Please **replace** the paragraph at **page 2, lines 20 to 23**, with a replacement paragraph amended as follows:

The objects of ~~claims 2 and 3~~ two further embodiment details each concern an advantageous method for generating the cylinder signal, which contains the information to be evaluated of the ~~right now~~ currently relevant cylinder.

Please **replace** the paragraph at **page 2, lines 25 to 33**, with a replacement paragraph amended as follows:

[[~~The~~]] Further embodiments ~~according to claims 5 to 9~~ concern favorable possibilities for signal improvement, which are performed in particular before transformation into the angle frequency range. By means of these upstream method steps the beginning of combustion can be determined even more exactly, since in this case also the signal information, which can be taken in the angle frequency range and which is relevant in this regard, can be determined with higher accuracy.

Please **replace** the paragraph at **page 2 line 35 to page 3 line 4**, with a replacement paragraph amended as follows:

In accordance with [[~~the~~]] another embodiment, ~~according to claim 10~~ the operational behavior of the internal combustion engine can be improved by using the detected exact beginning of combustion for (post-)regulating the concerned cylinder. The inadequacies initially described can then be largely avoided.

Please **add** a new heading at **page 3, above line 6**, as follows:

BRIEF DESCRIPTION OF THE DRAWINGS

Please **replace** the paragraph at **page 3, lines 6 to 10**, with a replacement paragraph amended as follows:

Preferred ~~examples of embodiment~~ example embodiments as well as further advantages and details of the invention will now be described ~~taken~~ in conjunction with the drawings. For clarification the drawing is not drawn to scale and certain aspects are shown only schematically, in which:

Please **add** a new heading at **page 3, above line 20**, as follows:

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS OF THE INVENTION

Please **replace** the paragraph at **page 5, lines 25 to 35**, with a replacement paragraph amended as follows:

Due to mechanical manufacturing tolerances, inaccuracies may occur [[~~at~~]] in the markings arranged [[~~at~~]] on the transmitter wheel 7. Thus, these markings cannot be located at equidistant distances from each other. The inaccuracies caused hereby in the segment signal SS can be eliminated on the basis of known correction methods. In DE 41 33 679 A1, DE 42 21 891 C2 and DE 196 22 042 C2 such correction methods are described. Here, correction values are detected, which are ~~deposited~~ stored in the control device 9, and by means of which the rotation speed signal

and also the segment signal can be ~~released from~~ freed of the mentioned transmitter wheel errors.

Please **replace** the paragraph at **page 6, lines 1 to 14**, with a replacement paragraph amended as follows:

A further possibility for signal improvement is to use a signal reconstruction method. The markings on the transmitter wheel 7 are usually located at rotation angle distances of 6 degrees or even 10 degrees. Here, however, the rotation speed of the shaft 6 is scanned too inaccurately for some applications. Present established applications, such as for example smoothness control or also combustion beginning control work more efficiently if a higher scanning rate is available. Use of the transmitter wheel 7 with a larger number of markings, however, is not unproblematic, ~~[[as]]~~ ~~because~~ with an increasing number of markings the clear space between the individual markings diminishes and thus the risk of contamination ~~enhances.~~ or soiling increases. A possible consequence would be ~~the ignoring of~~ that individual markings may be missed or ignored.

Please **replace** the paragraph at **page 7, lines 4 to 25**, with a replacement paragraph amended as follows:

A second possibility for increasing the scanning rate is a frequency transformation of the segment signal into the angle or angular frequency ~~region.~~ domain. This

transformation is performed in particular by means of a discrete Fourier-Transformation (DFT) or a discrete Hartley-Transformation (DHT). Unlike the Fourier-Transformation, the Hartley-Transformation beneficially carries out only [[~~mere~~]] purely real operations. This results in a lower computing burden or expenditure. Both transformations each respectively provide [[~~for~~]] an amplitude value and a phase value [[~~with~~]] for discrete angle frequencies, which in the ~~region~~ field of [[~~the~~]] internal combustion engines are also called orders. A continuous reconstruction signal for the segment signal SS results on the basis of a superposition of harmonic partial vibrations of those orders (=angle frequencies), for which in the angle frequency range relevant spectral portions, i.e. amplitude and phase values, have been determined. In this [[~~case~~]] regard, the individual harmonic partial vibrations are weighted with the respective associated amplitude and phase value, ~~respectively associated.~~ In this manner, ~~and when~~ while complying [[~~to~~]] with the scanning theorem, and exact reconstruction of the segment signal SS is possible, as far as the basic underlying signal is ~~periodical~~ periodic and band-limited.

[RESPONSE CONTINUES ON NEXT PAGE]